

## PATENT ABSTRACTS OF JAPAN

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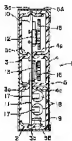
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(21)Application number : 06-211634 (71)Applicant : SONY CORP

(22)Date of filing : 06.09.1994 (72)Inventor : KAMEYAMA KAZUO

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### (54) CASE BODY STRUCTURE FOR ELECTRONIC APPLIANCE



#### (57)Abstract:

PURPOSE: To provide an inexpensive radio receiver provided with practical durability by using recyclable case body.

CONSTITUTION: Upper and lower cases 3 and 4 for constituting the case body 2 of a radio receiver 1 are molded into a box shape by a pulp material.

Incorporated objects 10 such as a printed wiring board 11 or the like are housed inside the case body 2 composed of the recyclable pulp material and the entire case body 2 is covered with waterproof coating paper 5. The printed wiring board

11 is held by respective ribs 3a, 3b, 3c and 4c integrally and projectingly formed on the upper and lower cases 3 and 4 of the case body 2. Thus, the inexpensive radio receiver 1 with improved portability with sufficient strength is obtained.

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## CLAIMS

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[Claim(s)]

[Claim 1] Case structure of the electronic equipment characterized by covering this case with covering while containing the built-in object of electronic equipment in the case which forms the case of electronic equipment in a core box by playback material, and consists of this playback material.

[Claim 2] Case structure of the electronic equipment according to claim 1 characterized by having projected and forming two or more ribs so that the built-in object of the above-mentioned electronic equipment may be inserted in the case which consists of the above-mentioned playback material.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the case structure of the electronic equipment which it is manufactured by playback material made from used paper etc., such as pulpwood and biodegradation plastics material of a

vegetable system, and can be recycled easily.

[0002]

[Description of the Prior Art] For example, the radio set is known as a small lightweight pocket device.

[0003]

[Problem(s) to be Solved by the Invention] However, since the case of the conventional above-mentioned radio set was made from the non-decomposing plastics material of a petroleum system, the public nuisance etc. had become a problem when disposal was carried out.

[0004] Then, this invention offers the case structure of the electronic equipment which can manufacture cheaply and has practical endurance recyclable moreover.

[0005]

[Means for Solving the Problem] The case structure of electronic equipment according to claim 1 forms the case of electronic equipment in a core box by playback material, and it has covered this case with covering while it contains the built-in object of electronic equipment in the case which consists of this playback material.

[0006] Moreover, in two or more ribs, it projects and the case structure of electronic equipment according to claim 2 is formed so that the built-in object of the above-mentioned electronic equipment may be inserted in the case which consists of the above-mentioned playback material.

[0007]

[Function] In invention according to claim 1, since the case of electronic equipment was formed by playback material, while the case of electronic equipment becomes recyclable and saving-resources-ization is attained, when a case becomes old, the above-mentioned case and covering become exchangeable easily.

[0008] Moreover, in invention according to claim 2, the reinforcement of the above-mentioned case which consists of playback material with two or more ribs

projected and formed is fully maintained, deflection deformation of this case is prevented so that the built-in object of electronic equipment may be inserted, and electronic equipment excellent in portability and endurance is cheap, and is offered.

[0009]

[Example] Hereafter, one example of this invention is explained in full detail with a drawing.

[0010] In drawing 3 and drawing 4, 1 is a small lightweight radio set (electronic equipment) in portable. The case 2 of this radio set 1 is the core box which carried out mold shaping with the pulpwood (playback material) which was able to do lower \*\* 3 opened and closed through hinge region 2a, and upper \*\* 4 from used paper etc., as shown in drawing 1 and drawing 2. In inverted-L-shaped each rib 3a formed so that it might project outside in the abbreviation center section of a bottom wall, and 3b, some built-in objects 10 of a radio set 1, and the printed circuit board 11 top which changes and the margo-inferior section are pinched on lower \*\* 3 of this case 2. Moreover, it really projects inside and the ribs 3c and 3c of the pair projected to inverted-L-shaped are formed in the center section of the bottom wall of lower \*\* 3 so that it may stand in a line in parallel. Furthermore, while having formed each rectangular notches 3d and 3e in the top and center of a right-hand side wall of lower \*\* 3, 3f of notches of a half side form is formed in the bottom wall.

[0011] as shown in drawing 1 and drawing 2, drawing Nakagami, bottom wall, and left-hand side wall of upper \*\* 4 of a case 2 fit into a bottom wall and a right-hand side wall on lower \*\* 3 -- as -- each wall of this lower \*\* 3 -- a part for the thickness -- it has formed so that it may become still larger. Moreover, while having formed rectangular dial window hole 4a in the surface wall bottom of upper \*\* 4, it really projects inside and the ribs 4c and 4c of an inverted-L-shaped pair are formed in the location which counters the ribs 3c and 3c of the pair of bottom \*\* 3 of the above of the center section. Furthermore, while having formed each rectangular notches 4d and 4e in the top and center of a left-hand side wall

of upper \*\* 4, 4f of notches of a half side form is formed in the bottom wall. And as shown in drawing 4 , when upper \*\* 4 is inserted in the rising wood of lower \*\* 3 and lower \*\* 3 and upper \*\* 4 are closed, the front rear face of the above-mentioned printed circuit board 11 is put between the ribs 3c and 3c of the pair of these bottom \*\* 3, and the ribs 4c and 4c of the pair of upper \*\* 4, and this printed circuit board 11 is held. Moreover, as shown in drawing 3 and drawing 4 , lower \*\* 3 and upper \*\* 4 which were closed the account of a top are covered with the sleeve-like waterproofing coat paper (covering) 5.

[0012] As shown in drawing 1 , drawing 2 , and drawing 4 , while having mounted all the electronic parts 12 and 13 required for radio reception, and 14 grades in the center from the bottom on a printed circuit board 11, the dial 15 for alignment and the dial 16 for volume control are supported enabling free rotation. Moreover, the cells 18 and 18 of a pair are attached in the bottom on a printed circuit board 11 through a pair each of terminal assemblies 17 and 17, enabling free attachment and detachment. Furthermore, the earphone jack 19 for connecting an earphone 20 is attached in the lower limit of a printed circuit board 11. The built-in object 10 of a radio set 1 is constituted by the cells 18 and 18 and the earphone jack 19 of these printed circuit boards 11, electronic parts 12, 13, and 14, the dial 15 for alignment, the dial 16 for volume control, a pair each of terminal assemblies 17 and 17, and a pair.

[0013] As shown in drawing 3 and drawing 4 , the above-mentioned waterproofing coat paper 5 is the shape of a sleeve which covers the whole bottom cases 3 and 4 and hides each of those ribs 3a, 3b, 3c, and 4c (box-like [ made of paper ]) on the case 2. And after inserting upper \*\* 3 and lower \*\* 4 which were closed into the waterproofing coat paper 5 of the shape of this sleeve, this case 2 whole is covered with the waterproofing coat paper 5 on the waterproofing coat paper 5 by inserting the tip side where the bottom covering devices 5A and 5B were bent between upper \*\* 4 of a case 2 from opening on this waterproofing coat paper 5 and by the side of an inferior surface of tongue. Moreover, a rectangle and each round pores 5a, 5d, 5e, and 5f are formed in the

location which counters dial window hole 4a, the dial 15 for alignment, the dial 16 for volume control, and the earphone jack 19 of the waterproofing coat paper 5, respectively. Furthermore, handling explanation of this radio set 1 is printed by the rear face of the waterproofing coat paper 5.

[0014] Moreover, each ribs 3a, 3b, 3c, and 4c by which protrusion formation was really carried out to above top \*\* 3 and lower \*\* 4 Liquefied pulpwood (playback material) P is poured in into the inverted-L-shaped cavity 33 which consists of the punch 31 and female mold 32 of the mold metal mold 30 shown in drawing 5 , and width of face t is manufactured by what has a high precision of about about 2mm by attracting the above-mentioned pulpwood P from each suction hole 32a of female mold 32.

[0015] Since this case 2 whole was covered with the waterproofing coat paper 5 according to the radio set 1 of an example above while carrying out mold shaping of the case 2 of this radio set 1 by pulpwood P at the core box and containing the built-in object 10 of printed circuit board 11 grade in the case 2 in which this recycle is possible, when exchanging a cell 18, it can be torn or the waterproofing coat paper 5 can be easily exchanged for the case 2 which became old. Since it is torn or this case 2 that became old is made from recyclable pulpwood P, saving-resources-ization can be attained.

[0016] Moreover, since it was held through each ribs 3a, 3b, 3c, and 4c in lower \*\* 3 and 4 as the printed circuit board 11 was inserted after the recyclable case 2 made from pulp was closed The reinforcement of the case 2 above-mentioned whole can be raised with each ribs 3a, 3b, 3c, and 4c, deflection deformation of this case 2 can be prevented, and the radio set 1 excellent in portability and endurance can be manufactured by low cost. Furthermore, a top, since it is not necessary to carry out the bis-stop of lower \*\* 3 and 4, or to carry out the bis-stop of the printed circuit board 11 into a case 2, low cost-ization can be attained much more also from this point.

[0017] Furthermore, since cushioning properties are in case 2 self, the so-called unit protection carton becomes unnecessary, and package loess-ization can be

attained, and a radio set 1 cannot break easily in the time of fall etc., and it can be widely used as various kinds of premium radios as disposable radio with practical endurance. Since it is dealt with in the rear face of the waterproofing coat paper 5 and explanation is already printed further again, it can be managed even if it does not newly attach directions for use, and low cost-ization can be attained much more also from this point.

[0018] In addition, according to said example, the pulpwood which consists of used paper etc. as playback material was used, but the case of electronic equipment may be manufactured by other playback material, such as biodegradation plastics material of a vegetable system. Moreover, covering may use what \*\* using the thing made of paper with waterproofness manufactured according to other quality of the materials, such as vinyl chloride resin, or what was manufactured by playback material, such as pulpwood and biodegradation plastics material of a vegetable system, may be used. Furthermore, although the contents which carried out radio reception by the earphone were heard, a loudspeaker is attached in a printed circuit board and you may make it hear it by the loudspeaker. As for electronic equipment, it is needless to say that said example is applicable to other electronic equipment, such as not only a radio set but a small tape recorder and a small CD player, further again.

[0019]

[Effect of the Invention] As mentioned above, since this case was covered with covering while containing the built-in object of electronic equipment in the case which forms the case of electronic equipment in a core box by playback material, and consists of this playback material according to invention according to claim 1, while becoming recyclable [ a case ] and being able to attain saving-resources-ization, when a case becomes old, the above-mentioned case and covering can be exchanged easily.

[0020] Moreover, since according to invention according to claim 2 it projected and two or more ribs were formed so that the built-in object of the above-mentioned electronic equipment might be inserted in the case which consists of

the above-mentioned playback material, the reinforcement of the above-mentioned case can fully be maintained, deflection deformation of this case can be prevented, it is cheap and electronic equipment excellent in portability and endurance can be offered.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The development view of the case which contained the built-in object of the radio set in which one example of this invention is shown.

[Drawing 2] The perspective view of the case which contained the built-in object of the above-mentioned radio set.

[Drawing 3] The perspective view showing the radio set which covered the above-mentioned case by waterproofing coat paper.

[Drawing 4] The sectional view of the above-mentioned radio set.

[Drawing 5] The expanded sectional view of the metal mold which carries out mold shaping of each rib of the case of the above-mentioned radio set.

[Description of Notations]

1 -- Radio set (electronic equipment)

2 -- Case

3a, 3b, 3c -- Rib

4c -- Rib

5 -- Waterproofing coat paper (covering)

10 -- Built-in object

P -- Pulpwood (playback material)

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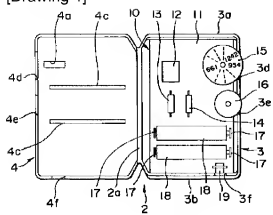
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**DRAWINGS**

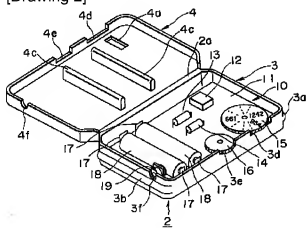
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[Drawing 1]



- 1...ラジオ受信機(電子機器)
- 2...筐体
- 3a, 3b, 3c...リブ
- 4c...リブ
- 5...防水コート紙(カバー)
- 10...内蔵物
- P...パルプ材(再生材)

[Drawing 2]



[Drawing 3]



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(71)出願人 000002185

ソニー株式会社  
東京都品川区北品川6丁目7番35号

(72)発明者 亀山 和夫

東京都品川区北品川6丁目7番35号 ソニー株式会社内

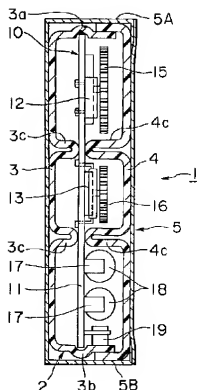
(74)代理人 弁理士 志賀 富士弥 (外1名)

(54)【発明の名称】 電子機器の筐体構造

(57)【要約】

【目的】 リサイクル可能な筐体を用い、実用上の耐久性を持った安価なラジオ受信機を提供する。

【構成】 ラジオ受信機1の筐体2を構成する上、下筐3、4を、パルプ材により箱型にモールド成形する。このリサイクル可能なパルプ材から成る筐体2内に印刷配線板11等の内蔵物10を収納すると共に、筐体2全体を防水コート紙5で被覆する。印刷配線板11は、筐体2の上、下筐3、4に一体突出形成された各リブ3a、3b、3c、4cにより挟み込まれるように保持される。これにより、十分な強度を有して携帯性に優れた安価なラジオ受信機1が得られる。



1

【特許請求の範囲】

【請求項1】 電子機器の筐体を再生材により箱型に形成し、この再生材から成る筐体内に電子機器の内蔵物を収納すると共に、該筐体をカバーで被覆したことを特徴とする電子機器の筐体構造。

【請求項2】 上記再生材から成る筐体上記電子機器の内蔵物を挟み込むように複数のリブを突出形成したことを特徴とする請求項1記載の電子機器の筐体構造。

【発明の詳細な説明】

【0001】

【産業上利用分野】この発明は、古紙等からできたパルプ材や植物系の生分解プラスチック材等の再生材により製造されて容易にリサイクルすることができる電子機器の筐体構造に関する。

【0002】

【従来の技術】例えば、小型軽量の携帯機器としてラジオ受信機が知られている。

【0003】

【発明が解決しようとする課題】しかしながら、従来の上記ラジオ受信機の筐体は、石油系の非分解プラスチック材から作られているため、廃棄処分する場合に公害等が問題となっていた。

【0004】そこで、この発明は、安価に製造できてもリサイクル可能で、且つ実用上の耐久性がある電子機器の筐体構造を提供するものである。

【0005】

【課題を解決するための手段】請求項1記載の電子機器の筐体構造は、電子機器の筐体を再生材により箱型に形成し、この再生材から成る筐体内に電子機器の内蔵物を収納すると共に、該筐体をカバーで被覆してある。

【0006】また、請求項2記載の電子機器の筐体構造は、上記再生材から成る筐体上記電子機器の内蔵物を挟み込むように複数のリブを突出形成してある。

【0007】

【作用】請求項1記載の発明では、電子機器の筐体を再生材により形成したので、電子機器の筐体がリサイクル可能となって省資源化が図られると共に、筐体が古くなった場合等には上記筐体及びカバーが容易に交換可能となる。

【0008】また、請求項2記載の発明では、電子機器の内蔵物を挟み込むように突出形成された複数のリブにより再生材から成る上記筐体の強度が十分に保たれて該筐体のたわみ変形が防止され、携帯性及び耐久性に優れた電子機器が安価で提供される。

【0009】

【実施例】以下、この発明の一実施例を図面と共に詳述する。

【0010】図3、図4において、1は携帯用で小型軽量のラジオ受信機（電子機器）である。このラジオ受信機の筐体2は、図1、図2に示すように、ヒンジ部2

2

aを介して開閉される下筐3と上筐4とを古紙等からできたパルプ材（再生材）によりモールド成形した箱型になっている。この筐体2の下筐3の上、下側壁の略中央部において外側に突出するように形成された逆U字状の各リブ3a、3b内には、ラジオ受信機1の内蔵物10の一部と成る印刷配線板11の上、下縁部を挟持してある。また、下筐3の底壁の中央部には平行に並ぶように内側に逆U字状に突出した一對のリブ3c、3cを一体突出形成してある。さらに、下筐3の右側壁の上側と中央には矩形的各切欠部3d、3eを形成してあると共に、下側壁には半丸形の切欠部3fを形成してある。

【0011】図1、図2に示すように、筐体2の上筐4の図中上、下側壁と左側壁は下筐3の上、下側壁と右側壁に嵌合するように該下筐3の各壁よりその厚み分更に大きくするように形成してある。また、上筐4の表面壁の上側には矩形的ダイヤル窓4aを形成してあると共に、その中央部の上記下筐3の一對のリブ3c、3cに対向する位置には逆U字状の一對のリブ4c、4cを内側に一体突出形成してある。さらに、上筐4の左側壁の上側と中央には矩形的各切欠部4d、4eを形成してあると共に、下側壁には半丸形の切欠部4fを形成してある。そして、図4に示すように、上筐4を下筐3の上縁部に嵌め合わせて下筐3と上筐4とを閉じたときに、これら下筐3の一對のリブ3c、3cと上筐4の一對のリブ4c、4cとの間で上記印刷配線板11の表裏面を挟み込んで該印刷配線板11を保持するようになっている。また、図3、図4に示すように、上記閉じられた下筐3と上筐4はスリーブ状の防水コート紙（カバー）5により被覆されるようになっている。

【0012】図1、図2及び図4に示すように、印刷配線板11上の上側から中央には、ラジオ受信に必要な全ての電子部品12、13、14等を実装してあると共に、同調用ダイヤル15と音量調整用ダイヤル16を回転自在に支持してある。また、印刷配線板11上の下側には各一對の端子板17、17を介して一對の電池18、18を着脱自在に取付けてある。さらに、印刷配線板11の下端にはイヤホン20を接続するためのイヤホンジャック19を取付けてある。これら印刷配線板11と電子部品12、13、14と同調用ダイヤル15と音量調整用ダイヤル16と各一對の端子板17、17と一對の電池18、18及びイヤホンジャック19とによりラジオ受信機1の内蔵物10が構成されている。

【0013】図3、図4に示すように、上記防水コート紙5は、筐体2の上、下筐3、4の全体を覆ってそれらの各リブ3a、3b、3c、4cを隠すようなスリーブ状（紙製の箱状）になっている。そして、このスリーブ状の防水コート紙5内、閉じられた上筐3と下筐4を挿入した後、防水コート紙5の上、下蓋部5A、5Bの折り曲げられた先端部を該防水コート紙5の上、下面側の開口部より筐体2の上筐4との間に差し込むこと

3

により、該筐体2全体が防水コート紙5により被覆されるようになっている。また、防水コート紙5のダイヤル窓孔4aと同調用ダイヤル15と音量調整用ダイヤル16及びイヤホンジャック19に対向する位置には、矩形及び丸形の各孔部5a, 5d, 5e, 5fをそれぞれ形成してある。さらに、防水コート紙5の裏面には、このラジオ受信機1の取り扱い説明が印刷されている。

【0014】また、上記上筐3と下筐4に一体突出形成された各リブ3a, 3b, 3c, 4cは、図5に示すモールド金型30の上型31と下型32からなる逆U字状のキャビティ33内に、液状のバルブ材(再生材)Pを注入し、下型32の各吸引孔32aより上記バルブ材Pを吸引することにより、幅tが約2mm位の精度の高いものに製造されている。

【0015】以上実施例のラジオ受信機1によれば、該ラジオ受信機1の筐体2をバルブ材Pにより箱型にモールド成形し、このリサイクル可能な筐体2内に印刷配線板11等の内蔵物10を収納すると共に、該筐体2全体を防水コート紙5で被覆したので、電池18を交換する場合などにおいて、破れたり、古くなった筐体2と防水コート紙5を容易に交換することができる。この破れたり、古くなった筐体2はリサイクル可能なバルブ材Pよりできているため、省資源化を図ることができる。

【0016】また、リサイクル可能なバルブ材製の筐体2の閉じられた上、下筐3, 4内において、各リブ3a, 3b, 3c, 4cを介して印刷配線板11を挟み込むようにして保持したので、各リブ3a, 3b, 3c, 4cにより上記筐体2全体の強度を向上させて該筐体2のたわみ変形を防止することができ、携帯性及び耐久性に優れたラジオ受信機1を低コストで製造することができる。さらに、上、下筐3, 4をビス止めしたり、印刷配線板11を筐体2内にビス止めしたりする必要がないので、この点からも低コスト化をより一段と図ることができる。

【0017】さらに、筐体2自身にクッション性があるもので、いわゆる個装カートンが不要となってパッケージレス化を図ることができ、また、落下時などにおいてラジオ受信機1が壊れにくく、実用上の耐久性を持った使い捨てラジオとして、また、各種の液晶ラジオとして広く使用することができる。さらにまた、防水コート紙5の裏面には取り扱い説明が既に印刷されているので、使用説明書を新たに添付しなくても済み、この点からも低コスト化をより一段と図ることができる。

【0018】尚、前記実施例によれば、再生材として古

4

紙等から成るバルブ材を用いたが、植物系の生分解プラスチック材等の他の再生材により電子機器の筐体を製造してもよい。また、カバーは防水性のある紙製のものを用いたが、塩化ビニル樹脂等の他の材質により製造したものを用いたり、バルブ材や植物系の生分解プラスチック材等の再生材により製造したりリサイクル可能なものを用いてもよい。さらに、イヤホンによりラジオ受信した内容を聞くようにしたが、印刷配線板にスピーカを取付けてスピーカにより聞くようにしてもよい。さらにまた、電子機器はラジオ受信機に限らず、小型テープレコーダや小型CDプレーヤ等の他の電子機器に前記実施例を適用することは勿論である。

【0019】

【発明の効果】以上のように、請求項1記載の発明によれば、電子機器の筐体を再生材により箱型に形成し、この再生材から成る筐体内に電子機器の内蔵物を収納すると共に、該筐体をカバーで被覆したので、筐体のリサイクルが可能となって省資源化を図ることができると共に、筐体が古くなった場合等には上記筐体及びカバーを容易に交換することができる。

【0020】また、請求項2記載の発明によれば、上記再生材から成る筐体2に電子機器の内蔵物を挟み込むように複数のリブを突出形成したので、上記筐体の強度を十分に保って該筐体のたわみ変形を防ぐことができ、携帯性及び耐久性に優れた電子機器を安価で提供することができる。

【図面の簡単な説明】

【図1】この発明の一実施例を示すラジオ受信機の内蔵物を収納した筐体の展開図。

【図2】上記ラジオ受信機の内蔵物を収納した筐体の斜視図。

【図3】上記筐体を防水コート紙で覆ったラジオ受信機を示す斜視図。

【図4】上記ラジオ受信機の断面図。

【図5】上記ラジオ受信機の筐体の各リブをモールド成形する金型の拡大断面図。

【符号の説明】

1…ラジオ受信機(電子機器)

2…筐体

3a, 3b, 3c…リブ

4c…リブ

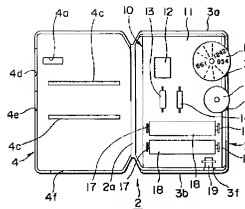
5…防水コート紙(カバー)

10…内蔵物

P…バルブ材(再生材)

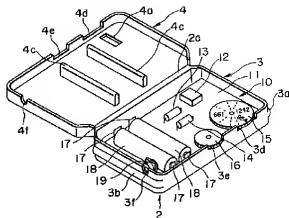
40

【図1】

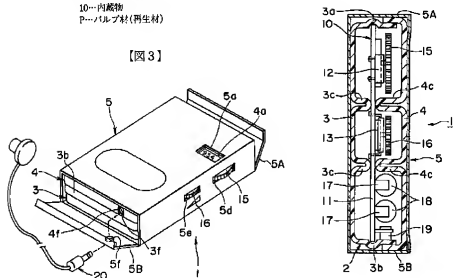


- 1…ラジオ受信機(電子機器)  
 2…電池  
 3a, 3b, 3c…リブ  
 4c…リブ  
 5…防水コート膜(オパー)  
 10…内蔵物  
 P…パルプ材(再生材)

【図2】



【図3】



【図5】

